Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
NextNav Petition for Rulemaking	)	ET Docket No. 24-240
	)	

Comments of WifiForward

Introduction and Summary

WifiForward is a broad coalition of entities that innovate, use and deliver services over Wi-Fi and other unlicensed spectrum technologies.[1] WifiForward actively promotes Wi-Fi and unlicensed technologies to ensure the United States can meet its broadband goals, create opportunities for homegrown innovation that can be exported globally, provide robust pathways for consumers to access the internet, and meet the diverse needs of residential and enterprise consumers. Consumers are increasingly adopting unlicensed wireless networking at home, at work and at play, managing connectivity to an ever-increasing array of devices, and creating economic value that has been estimated at $1.5 trillion by 2025.

As an organization that promotes and defends unlicensed spectrum, WifiForward is interested in policies that impact investment and innovation in unlicensed bands. WifiForward is concerned that the approach NextNav has taken in its Petition for Rulemaking with respect to unlicensed use in 902-928 MHz falls short and fails to recognize the spectrum policy principles that the Commission should consider in this docket. Specifically, NextNav confuses Part 15 non-interference device requirements with spectrum policy. It is spectrum policy, not Part 15, that should determine how to utilize commercial spectrum bands to advance the public interest, and whether modifications are warranted. The Commission can, and should, avoid rule changes that would create wholesale disruptions to American's reliance on unlicensed technologies even if

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[1] Additional information about WifiForward is available at www.wififorward.org

Part 15 rules do not provide harmful interference protection to individual unlicensed devices. Second, 902-928 MHz unlicensed use cases are exploding, while the technologies in use are both unique to the band and depend upon its specific propagation characteristics. Third, NextNav has failed to demonstrate that its proposed high-power 5G network and Part 15 devices can coexist under the conditions proposed by NextNav. WifiForward believes that the Commission should retain the current "no unacceptable interference" rule and otherwise support unlicensed use and growth in 902-928 MHz. Unlicensed use of the band is robust, growing, and solving a myriad of real problems for businesses across the country, while advancing capabilities for consumers, as well. WifiForward urges the Commission to decline to take any action on the Petition for Rulemaking until NextNav can present a clear plan for how NextNav's future operations will not adversely impact the unlicensed ecosystem.

Background

As described in the Commission's Public Notice,[2] NextNav seeks to create a 5-megahertz uplink in the 902-907 MHz band paired with a 10-megahertz downlink in the 918-928 MHz band, while shifting all the remaining non-M-LMS licensees to the 907-918 MHz portion of the band. NextNav proposes that it be assigned an exclusive, nationwide 15-megahertz flexible use license in the uplink and downlink bands with higher power limits aligned with the Part 27 rules for full power macro deployments so that it might provide a 5G-based location system servicing national wireless carriers for emergency calling, as well as for unspecified other uses.[3] The Notice states that:

> NextNav indicates that it will work with all the incumbents in the band, including federal (radiolocation, fixed, and mobile), ISM, non-M-LMS, amateur,

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[2] Public Notice, Wireless Telecommunications Bureau and Office of Engineering and Technology Seek Comment on NextNav Petition for Rulemaking, WT Docket No. 24-240, RM-11989, released August 6, 2024 ("Notice").

[3] NextNav also proposes modifications to the Commission's rules, such as the addition of mobile and fixed allocations to the non-Federal portion of the Table of Frequency Allocations, Part 90 modifications, and the addition of a new subpart for a "Terrestrial Positioning, Navigation, and Timing Service" (TPNT). The Notice specifies that NextNav's petition asserts the TPNT use of the reconfigured band will result in a significant but unspecified excess capacity that NextNav plans to utilize in some other way, such as leasing to wireless carriers.

> and unlicensed part 15 device users, and suggests that the Commission could place conditions on a newly issued NextNav license to ensure protection.[4]

The Notice recognizes that there are "millions" of Part 15 devices operating in 902-928 MHz, including in the 15 MHz of spectrum NextNav seeks to utilize, but that NextNav has provided no information or technical analyses about how its high-powered 5G network might impact those Part 15 devices. Moreover, NextNav requests that the Commission remove the existing obligation on its network operations to perform testing to ensure coexistence with Part 15 devices, as well as to amend its rules requiring Next Nav to not cause unacceptable levels of interference to Part 15 devices in the band, as specified in rule 90.353(d) which states:

> [Economic Area] multilateration [location and monitoring service] licenses will be conditioned upon the licensee's ability to demonstrate through actual field tests that their systems do not cause unacceptable levels of interference to 47 CFR part 15 devices.

NextNav's request that the FCC eliminate this responsibility must be understood as an admission that it cannot support coexistence in the band.

The Part 15 device rules should not be confused with spectrum policy

NextNav asserts that the Commission need not consider whether its proposal will disrupt consumer and enterprise unlicensed devices because Part 15 does not protect individual unlicensed devices from harmful interference.[5] But this mistakes the rules governing individual devices with larger Commission spectrum policy decisions on how best to support consumer and enterprise wireless operations. While Part 15 does not protect individual unlicensed devices from harmful interference, it does not address how the Commission should organize an entire band. In considering the Petition, the Commission may and should adopt spectrum policies which recognize the importance of unlicensed technologies to the country. It should reject band-wide proposals that would disrupt unlicensed operations. Instead, the Commission should address the core question that the NextNav Petition raises – e.g., for public interest purposes, what is the most compelling use of 902-928 MHz?[6]

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[4] Notice at 4.

[5] *See* NextNav Petition for Rulemaking at 17-18 ("Unlicensed devices have the lowest priority and cannot claim interference rights, except for unacceptable interference from M-LMS licensees in some cases, and may not cause harmful interference to M-LMS and non-M-LMS licensees, amateur operations, or other licensed systems.") (footnotes omitted); *Id.* At 65 ("Users of Part 15 devices do not have any allocation status in the Commission's rules. Instead, the Commission makes spectrum available for Part 15 devices on an unprotected and non-interference basis. Under Part 15, unlicensed devices may not cause harmful interference to LMS licensees, amateur operations, or other licensed systems in the Lower 900 MHz Band.").

The Commission has long recognized that its unlicensed spectrum approach of adopting careful device technical specifications and low power levels has yielded unprecedented innovation and investment public interest benefits.[7] When the Commission considers whether or how to change the rules for a band used by unlicensed devices, that consideration necessitates understanding today's sophisticated unlicensed networking capabilities that support broadband delivery, enterprise networks, and the explosion in billion dollar use cases resulting from the unlicensed delivery of internet protocol messages between devices.[8] Policymakers also must consider the significant economic and social value that unlicensed bands deliver and must understand the consequences of rule changes that could disrupt those benefits, not just for those who have invested in and/or incorporated unlicensed into their operations, but for consumers, as well.

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[6] The language of Part 15 is quite clear that it speaks in narrow terms to the conditions under which unlicensed devices shall be built and operated. Part 15.1(a) provides that the scope of Part 15 is to promulgate "regulations under which an intentional … radiator may be operated without an individual license." Part 15.5(a) states that "persons operating intentional or unintentional radiators shall not be deemed to have any vested or recognizable right to continued use of any given frequency…." Part 15.5(b) is the design-it-for-coexistence rule: "Operation of an intentional, unintentional, or incidental radiator is subject to the conditions that no harmful interference is caused and that interference must be accepted that may be caused by the operation of an authorized radio station…." While these rules are helpful in both guiding design, and in resolving individual cases of harmful interference, they do not speak to the larger spectrum policy question of whether and how a band should be designated for unlicensed use to begin with, and whether modifications to that bands' operations are warranted and for what purpose.

[7] *See generally Unlicensed Use of the 6 GHz Band; Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz,* Report and Order and Further Notice of Proposed Rulemaking, 35 FCC Rcd 3852(2020) (*6 GHz Order*), *reversed in part, aff'd in part and remanded*, *AT&T Servs. Inc., v. FCC*, 21 F.4th 841(D.C. Cir. 2020) (affirming *6 GHz Order* and reversing and remanding to address issue of whether to "reserve a sliver of the 6 GHz band for licensed mobile operation"). *See also Unlicensed Use of the 6 GHz Band; Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GH,* Second Report and Order and Further Notice of Proposed Rulemaking, ET Docket 18-295 (October 19, 2023) (Statement of Chairwoman Jessica Rosenworcel: "Our lives run on unlicensed spectrum…. No matter who you are or where you live, the odds are good that all sorts of activities in your day-to-day life depend on wireless airwaves that are unlicensed."); *Unlicensed Use of the 6 GHz Band; Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, Notice of Proposed Rulemaking, 33 FCC Rcd 10496 (2018) (Statement of Commissioner Brendan Carr: "We hear so much in telecom about the difficulty of connecting the "last mile." And when we are at home or at work the final few feet of that last mile are often spanned by Wi-Fi, Bluetooth, or another unlicensed technology."); and Remarks of Commissioner Geoffrey Starks at the 2024 U.S. Tech for Climate Action Conference, National Press Club, Washington D.C. March 21, 2024 ("With the right connected technologies, we can modernize our grid and upgrade its capabilities and resilience. A smarter grid can help us unlock two-way power transmission and more precision control, enhancing our ability to tap into new renewable energy sources and manage new devices like plug-in vehicles and electric heat pumps. With the right connected technologies, we can also make our roads safer, more accessible, and more efficient. Intelligent infrastructure means less time spent in congestion. It means more time spent getting people and goods where they need to go. With the right connected technologies, we can help our factories, farms, and heavy industries do more with less. The IoT revolution has made it easy to attach a sensor to just about every aspect of the production process."). Commissioner Starks' litany of IoT capabilities are exactly those provided by 902-928 MHz unlicensed devices.

The Commission need not look far to see this principle in action. When the Commission altered the rules to permit LMS services in the 900 MHz band, it declined to constrain unlicensed innovation. In rule 90.361, it designated a wide variety of unlicensed devices in the 902-928 MHz band that would "*not* be considered causing harmful interference" to LMS – a unlicensed class that included devices using "indoor" antennas and a wide swath of outdoor devices with outdoor antenna rules quite similar to existing Part 15 rules or that are deployed in specific use cases such as education or health care. In addition, in 2011, as affirmed in 2013, the Commission required LMS licensees to conduct field tests to demonstrate that their operations would not cause unacceptable interference into Part 15 devices in the 902-928 MHz band.[9] The Commission recognized then, as it should do now, that it should protect the value that unlicensed brings to both innovation and consumers, even as it sought to open an opportunity for LMS networks to assist wireless carriers.

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[8] For example, total revenue of video on demand has been estimated at $70 billion, with music streaming an additional $14.3 billion. Statista 2023 report available at https://www.statista.com/topics/1594/streaming/#:~:text=In%20the%20United%20States%2C%20the,billion%20U.S.%20dollars%20that%20year.

[9] Request by Progeny LMS, LLC for Waiver of Certain Multilateration Location and Monitoring Service Rules, WT Docket No. 11-49, Order (DA 11-2036), 26 FCC Rcd 16878, 16889 ¶ 29 (WTB/OET, rel. Dec. 20, 2011) ("Limited Waiver Order"), *affirmed in* Request by Progeny LMS, LLC for Waiver of Certain Multilateration Location and Monitoring Service Rules, WT Docket No. 11-49, released June 6, 2013 at para 19 ("The Commission's intent with regard to field testing was not to create and apply a specific minimum standard of interference protection to all unlicensed devices operating in the 902-928 MHz band, but instead to ensure more broadly that the various types of unlicensed devices permitted under the Commission's Part 15 rules would continue to be able to operate in the band when potential interference from M-LMS was introduced. The Commission expressly recognized that M-LMS potentially would cause interference to some of the various types of unlicensed operations in the band, and it modified the Part 15 rules to enable certain spread spectrum devices to avoid using M-LMS channels.").

The 902-928 MHz unlicensed use cases are exploding and the technologies supporting these are unique to the band and depend upon its propagation characteristics

The 902-928 MHz frequency range is a core band for Internet of Things use cases, driven in substantial part by its advantageous propagation characteristics. While "traditional" Wi-Fi in the 2.4, 5 and 6 GHz bands support an array of IoT use cases, the networks in these Wi-Fi bands are limited by device power and signal propagation, and, with the prominent exception of U-NII-3, are mostly used for indoor networking or short range outdoor networking (e.g., a few hundred feet) as the spectrum rules allow. This is not the case in the 900 MHz band, where even lower power transmitters can ably send a usable signal over longer distances or through obstacles that might challenge transmitters at higher frequencies.

Moreover, the device "families" that now lead device sales in the 900 MHz band have been optimized for battery power. That means one end point can be placed in an area with no electricity and still beam a signal back to the network reliably for a long period of time. That has opened up IoT use cases not feasible in "traditional" Wi-Fi bands. LoRaWAN (supported by the LoRa Alliance), HaLow (supported by the Wi-Fi Alliance), and Wi-SUN are just a few of the examples of wireless technologies that support a long list of use cases – utility metering, critical infrastructure monitoring, environmental monitoring, neighborhood-wide networking, security systems (including servicing of remote structures), asset tracking, and in-building monitoring of heating, cooling, water and refridgerant systems to name a few.

NextNav has failed to demonstrate that its high-power network can coexist with Part 15 devices

According to the Notice, NextNav states that it is completing technical analyses to support its claim that coexistence between its high-power 5G NextGen system and Part 15 devices "is achievable" and "will work with unlicensed users to understand their spectrum requirements." But, as noted above, even prior to completing this analysis, NextNav requests that the Commission remove and modify rules that ensure coexistence with Part 15 devices and prohibit NextNav from causing unacceptable levels of interference to Part 15 devices.

To date, NextNav has failed to provide any such technical coexistence analysis. Nor is it clear absent further analysis that NextNav's proposed high-power system – at transmit power levels more than 600 times NextNav's existing 30-watt limit – would allow Part 15 devices to continue to operate in the 900 MHz band as they do today. At minimum, the Commission should decline to take any further action on NextNav's proposal unless and until further studies ensuring coexistence with Part 15 devices are complete and verified.

Conclusion

Unlicensed operations in the 900 MHz band are important to a wide range of consumer and enterprise applications. Adopting NextNav's proposal to radically increase its transmit powers and remove protection for unlicensed devices threatens to hobble these technologies. The Commission should retain the 900 MHz band's important "no unacceptable interference" rule and otherwise support unlicensed growth in 902-928 MHz. Unlicensed use of the band is robust, growing, and needed for critical infrastructure, municipal infrastructure, highway infrastructure and tolling, smart home devices, security cameras and systems, agriculture, retail and supply chain, and more. WifiForward urges the Commission to decline to grant the Petition for Rulemaking until and unless NextNav presents a clear plan for how its future operations will not adversely impact unlicensed uses and growth.

Respectfully submitted,

WifiForward

By: Mary Brown
Executive Director